Chapter V
Public Utilities

Goal

- ***!*** *Maintain and enhance existing infrastructure and increase the life cycle of future infrastructure development.*

For purposes of this chapter, "public utilities" provide a wide range of basic services to the community, including water, electricity, landfills, sanitary and storm sewers, and street maintenance. The citizens are interested in receiving safe, efficient and progressive utility services in the most cost effective manner.

A. Lincoln Water System

Goals

- ***!*** *Protect the quantity and quality of ground and surface water.*
- ***!*** *Ensure the preservation and proper utilization of environmental resources (e.g., prime agricultural land, soils, water, clean air, absence of noise, and native prairie and woods).*

The Lincoln Water System is owned by the City and is operated under the direction of the Mayor and the City Council. The City Charter gives the City Council the authority to adopt the annual budget, to incur debt, and to fix rates and charges. It is a revenue producing and self-supporting (i.e., no tax funds are used) system under the Department of Public Utilities. An orderly, sequenced growth plan assures adequate time for both building and financing facilities. A prioritizing of phased areas would benefit the preparation for water service to new locations.

The principal mission of the water system is to deliver an adequate supply of quality water to the customers economically.

Lincoln's principal source of water is groundwater in the Platte River Valley near Ashland, Nebraska. A major expansion of the well field, treatment plant and transmission facilities at this location is now under construction and should provide the City with an adequate supply of water for the twenty year planning period. In addition to the Ashland supply the City has supplemental wells in Antelope Park, also a groundwater source. The water system has a continuing commitment to promote water conservation by system customers. Home builders, media, realtors, construction contractors, and the public show support for water conservation. Opportunities for responsible use of water by customers should be encouraged as a means by which to increase revenues and further spread the costs of the completed expansion of the system.

The distribution system is divided into four pressure zones (Figure 42) which are interconnected through a system of storage facilities and pumping stations which keep operating pressures in the 35-100 PSI range. Because the system operates on elevation, not drainage basins, reservoirs and pump stations are often located outside the area serviced, and many times outside of the City.

The existing water distribution system is made up of more than 920 miles of water mains, 6,400 fire hydrants, and 15,500 valves. Pipes providing service to customers range in size from 4" to 16" diameter and total 800 miles. There are 120 miles of transmission and transfer mains which range from 24" to 54" diameter.

The City experiences 100 to 150 broken water main events each year, caused primarily by corrosion of ductile or cast iron pipes, internal pressure surges (water hammer) and external pressures due to frost during extreme winter temperatures. Limited fire flow capabilities exist in older areas of the City where much of the distribution system is made up of long reaches of 4" mains, some of

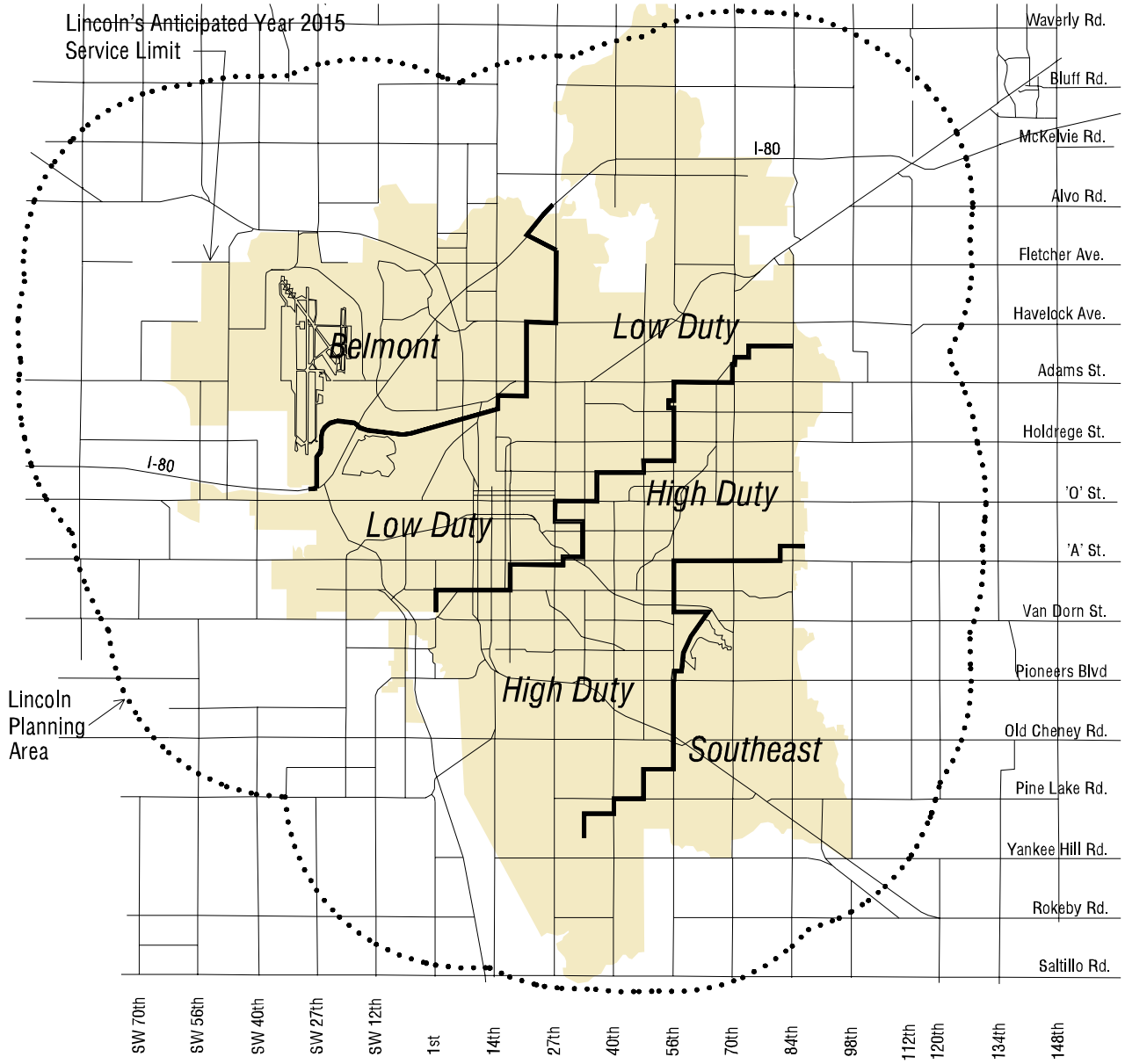

Figure 42

Water Pressure Zones of the Lincoln Water System

Lincoln City/Lancaster County
Comprehensive Plan

which have a build up of scale (internal accumulation of minerals) further reducing the effective diameter of the pipe. Through the City's ongoing replacement program, approximately 4,000 to 6,000 feet of main are replaced each year. However, the level of resources (i.e. budget and/or staff) for replacement will need to be increased in future years to keep broken mains and the subsequent disruption of customer's service to a minimum.

The Lincoln Water System will not provide water service beyond the corporate limits of the City. As Federal and State drinking water standards increase, the number of requests for city water will likely increase. However, the policy to limit the service area to the City of Lincoln will provide for contiguous growth, will allow for efficient short and long range planning and management of the system; will limit inefficient and problematic long dead ends; and will provide for a stable basis for long range planning.

Lincoln's wells and treatment plant, located in Saunders County, rely upon support from the City of Ashland. This support is in the form of wastewater service to the water treatment plant and police, fire and emergency medical services. The City of Lincoln, in consideration of these unique services, may supply water to Ashland under negotiations approved by the Lincoln Mayor.

The overall design of the water system includes looping to provide for reliable service, minimize service outages from broken pipes, provide more reliable fire flows and prevent water quality problems associated with dead end mains (Figure 43).

The cost of local water development will be paid by the benefited property. Distribution grid (larger mains) may be partially subsidized by the Lincoln Water System if such improvement is in compliance with the comprehensive plan and has been scheduled through the capital improvement process.

The Lincoln Water System projects the need for a wide array of facility improvements over the planning period. These include new modifications to water mains, reservoirs, and pumping stations. The general locations for many of these facilities are shown on Figure 44. Within the existing City, several major improvements are necessary to deliver an adequate supply of quality water to existing and new development areas:

1. Additional pipeline capacity from Ashland (supply) to Lincoln, i.e., 54" pipeline from Greenwood to Lincoln.

2. Additional pipeline capacity from 77th & Vine pump station toward growth areas in south and southeast Lincoln (i.e., 48" pipeline from 77th & Vine to 84th & South Street).

3. Additional reservoir capacity to provide storage for peak day, peak hour and fire reserves in the following pressure zones, i.e.: (Amendment 9423)

   Southeast - additional reservoir at 84th & Pine Lake Road.

   Low Duty - additional reservoirs at northeast (102nd & Alvo Road) and at 77th & Vine.

   Belmont - new reservoir north of Highlands.

4. Booster pump stations will be required to create additional booster pressure zones (based on topography) near 84th & Highway 2 and 56th & Pine Lake Road. (Amendment 9423)

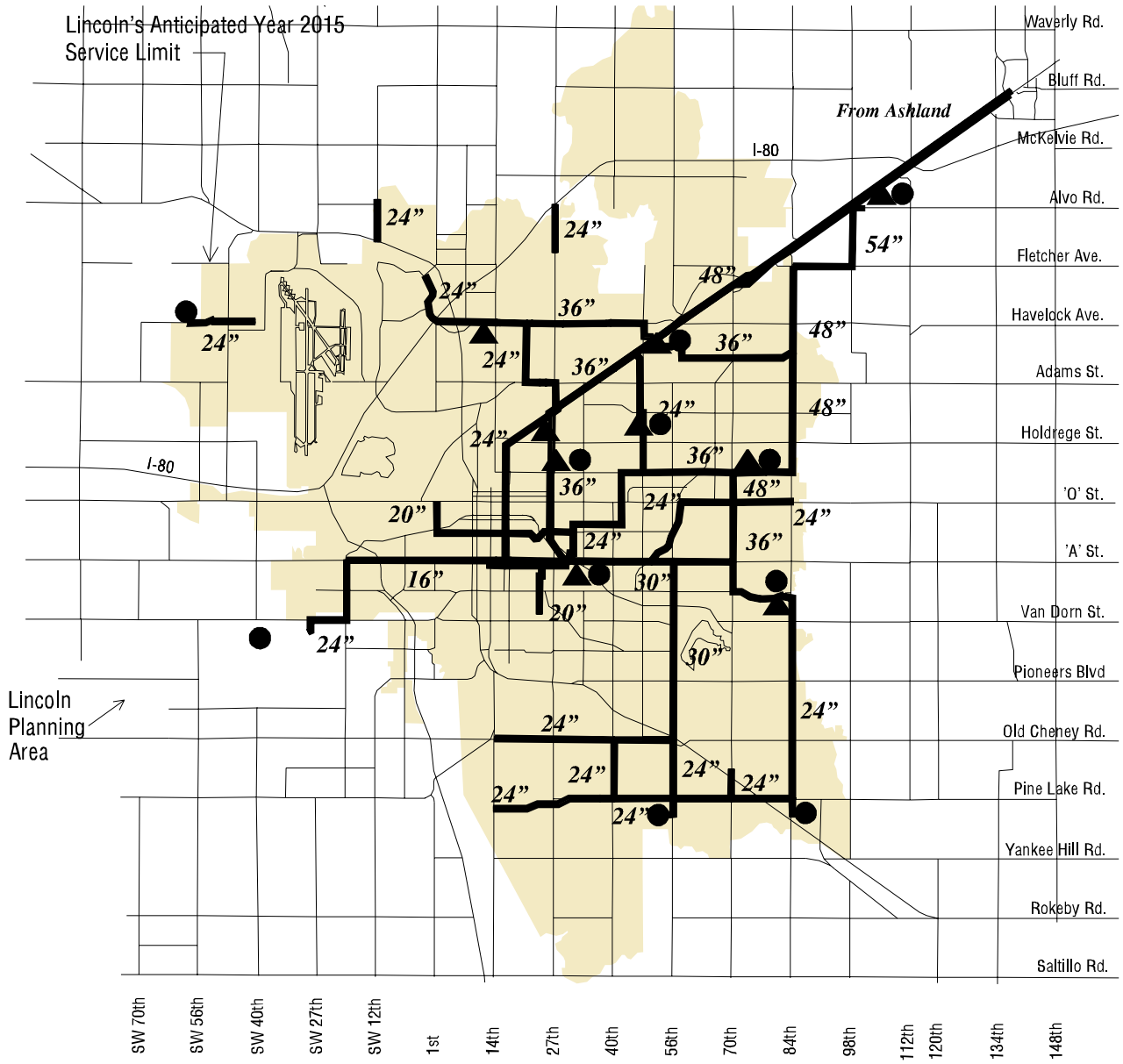

Figure 43

Existing Major Facilities of the Lincoln Water System

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Water Mains

Pumping Station

Reservoir

Lincoln City/Lancaster County
Comprehensive Plan

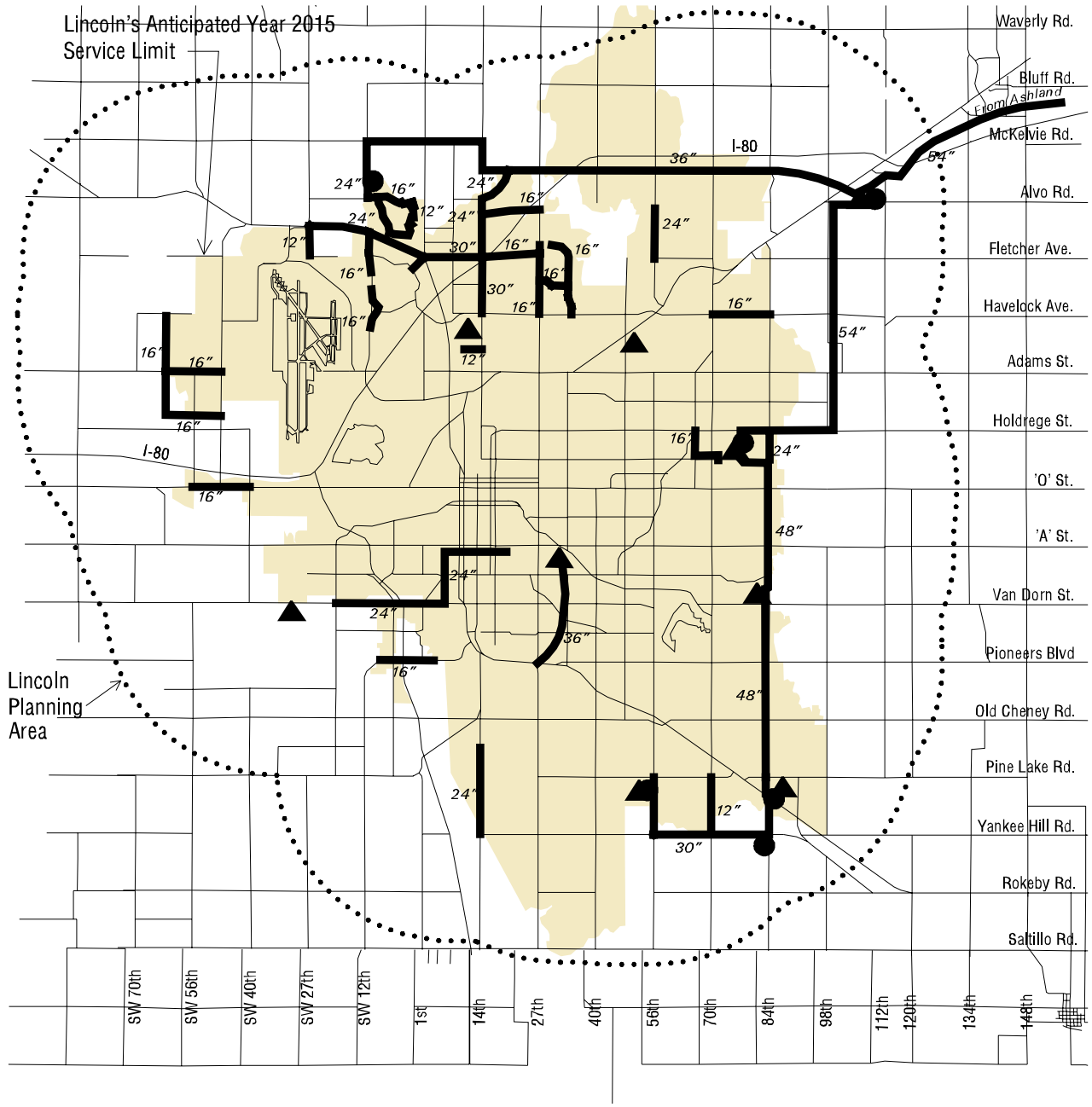

Figure 44

Major Future Water System Improvements for the Lincoln Water System

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Lincoln City/Lancaster County
Comprehensive Plan

Water Mains

Pumping Station

Reservoir

(Note: In some instances, final alignments will be determined through future study.)

Figure 44 also shows the potential extension of many 16 inch and 24 inch mains to serve future growth areas within the year 2015 service limit. The general location of booster pumping stations is shown, as well as existing pump stations which will require scheduled modifications.

The Public Works and Utilities Department completed the 'Water Distribution System Master Plan Report' dated December, 1994. The plan lays out the long term facilities improvement plan for the planning period, as well as potential service extensions beyond Lincoln's anticipated future service limits. The Master Plan is hereby incorporated by reference as an approved component of the Plan. The Public Works and Utilities Department should continue to monitor and evaluate system capacities, pertinent design standards, and identify opportunities or constraints. (Amendment 9405)

Strategies:

- Maintain the policy of not providing water service beyond the City limits of Lincoln.
- Continue the policy of private financing the cost of local water development. Consider institution of a benefit formula, by which the cost of mains that serve an entire area are shared by beneficiaries of the improvement. Continue to provide public funding for projects that provide community-wide benefits, programming these expenditures through the capital improvement process.
- Implement a program of facility improvements during the planning period, as proposed in this section. Main sizes illustrated in Figure 44 are approximations and vary somewhat after detailed engineering. Each main should be sized to provide proper service to its distribution area.
- Implement the long-range water improvement plan, monitor development with respect to system capacities, and schedule improvements accordingly. (Amendment 9405)
- Continue to encourage water conservation practices.

B. Lincoln Wastewater System

Goal

- *Develop an aggressive program for the treatment and use of sewage.*

The Lincoln Wastewater System is owned by the City and is operated under the direction of the Mayor and the City Council. It is a revenue producing and self-supporting (i.e., no tax funds are used) system operated under the Department of Public Utilities. An orderly, sequenced growth plan assures adequate time for building and financing facilities. To assure timely service to new areas, a prioritization of areas for development is essential.

The principle mission of the wastewater system is to collect and treat wastewater from residential, commercial and industrial customers within the corporate limits of the City and liquid waste from within the City and County economically.

There are two treatment facilities in operation: Theresa Street and the Northeast Treatment facility (Figure 45). New Federal clean water regulations may significantly alter the permitted quality of effluent being discharged by these facilities into Salt Creek and will require treatment facility improvements at both treatment plants within the next five years.

The collection system is generally a gravity feed system that is designed to accommodate urbanization of drainage basins and sub-basins. This system encourages orderly growth within the natural drainage basin boundaries. This policy encourages urban growth from the lower portion of the drainage basin and prohibits pumping of wastewater across basin boundaries.

The present public sanitary sewer system consists of approximately 740 miles of sewer ranging from 6" to 60" in diameter. Some of these sewers date back to the 1880's. A majority of the system has vitrified clay pipe (VCP, 85%-90%). While VCP material is very strong and resistant to the changing chemical conditions common in sewer systems, it is also brittle and can break when exposed to excessive external forces such as the growth of tree roots and/or weight of soil bearing on the pipe.

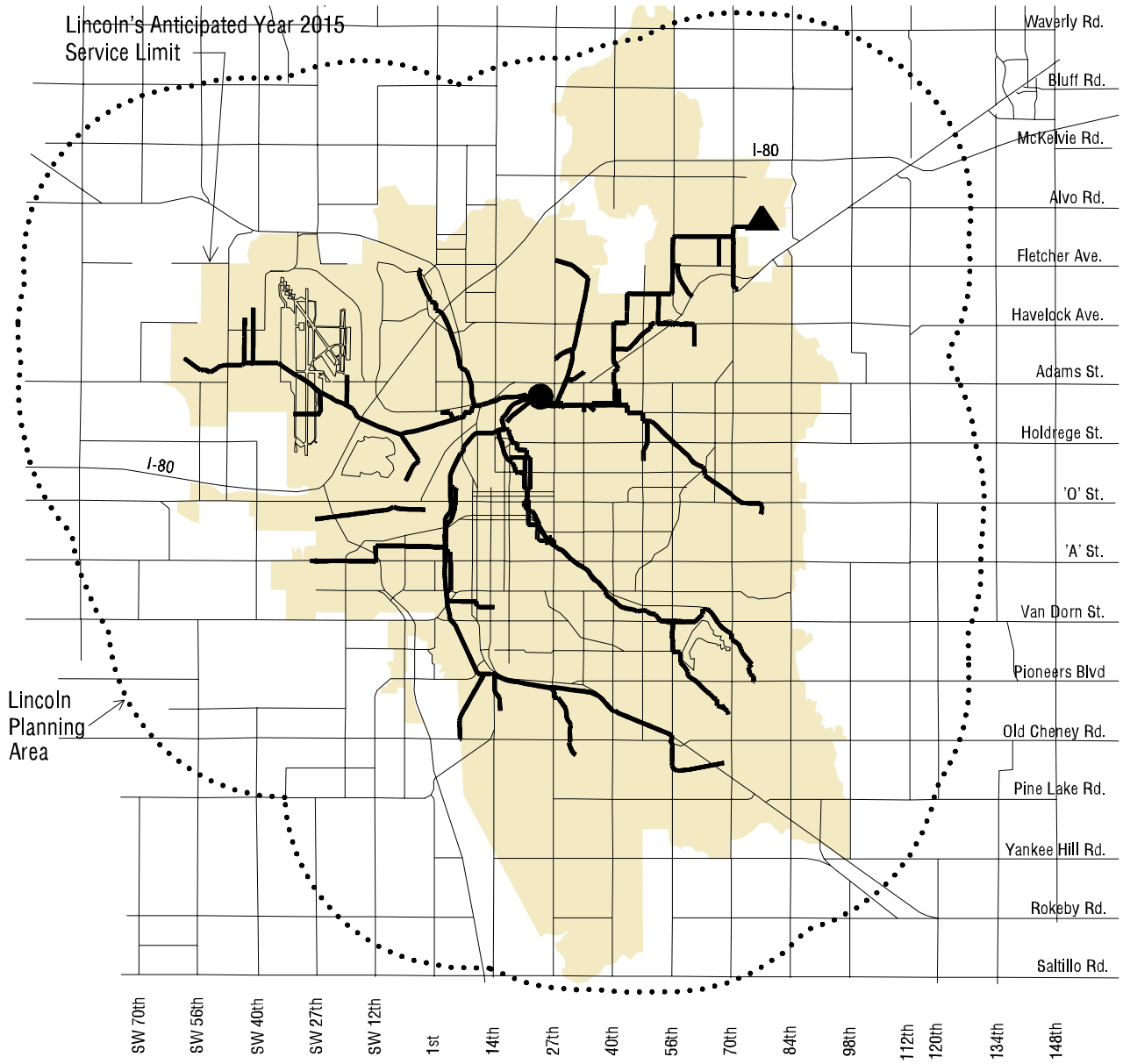

Figure 45

Major Existing Sewer Lines 18 inches or Greater Serving the City of Lincoln

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Lincoln City/Lancaster County
Comprehensive Plan

● *Theresa St. Wastewater Treatment Plant*

▲ *Northeast Wastewater Treatment Plant*

Much of the work done by the City involves repairing the old VCP which was installed during or prior to World War II. In older neighborhoods, larger trees have grown to the point where roots begin to penetrate through the pipe joints and eventually crack or break the sanitary sewer. These broken pipes can be a source of excessive infiltration (intrusion of ground water) or can interfere with sewer service, potentially causing a sewer backup into homes. Many of the sewers which need repairs are in areas where there is a narrow easement width and no public right-of-way with large trees and private structures on top of or adjacent to the sewer system, making repairs expensive and difficult to accomplish. The Lincoln Wastewater System makes approximately 150 repairs a year, many of which fall into this category. The City also does internal TV inspection of approximately 60 miles of sanitary sewer a year, 50% of which is new construction. This internal TV inspection is the tool used to develop a priority repair program.

The Lincoln Wastewater System will not provide sewer service beyond the corporate limits of the City. This policy promotes contiguous growth, allowing the department to control the allocation of treatment capacity at each sewage treatment facility and for rational planning and development of the system. Both wastewater treatment facilities are approaching their flow quantity capacities.

Figure 46 presents the trunk sewer improvements anticipated for completion during the planning period. Extensions No. 3, 5, 6 and 7 are constrained by the existing Salt Valley Trunk Sewer capacity. These include:

- Extension No. 1 West Highlands Interceptor - This line will have the capability to serve the West Highlands and areas adjacent to Air Park West. Construction of this extension has been completed.

- Extension No. 2 North Bank Trunk Sewer - The preliminary alignment and design have been completed. The timing of this project is dependent upon growth in areas 14 and 15.

- Extension No. 3 West 'O' Street - This line is an extension of an existing 36" main that generally runs westward along the southern edge of West 'O' Street. This would serve the commercial and industrial development anticipated to occur in this area.

- Extension No. 4 Lynn Creek - This extends the trunk sewer line currently serving the Highlands by crossing State Highway 34 to the north.

- Extension No. 5 South 27th and Pine Lake Road - This extension will be required to serve the residential, commercial, and school development proposed for the 27th and Pine Lake Road area. As illustrated, the line would be sized to serve area 12 (see Figure 46), with a portion of the extension costs borne by the developer of that area.

- Extension No. 6 Beals Slough - The low density residential land use in this area limits demand at this time for public wastewater service. Experience has shown that access to the sanitary sewer will likely be required at some point in the future.

- Extension No. 7 Antelope Creek - This extension should only require a relatively small diameter pipe with much of the cost the responsibility of the developers.

- Extension No. 8 Salt Creek to Devaney - To run from Theresa Street Treatment Plant to the Devaney Sports Center. Development and construction process is underway. (Amendment 9416)

- Extension No. 9 Little Salt Creek - To serve areas near the intersection of No. 27th Street and I-80, an extension to the Little Salt Creek Trunk Sewer is required. This project would involve constructing approximately one mile of 36" diameter sewer.

- Extension No. 10 Haines Branch - future development in this area may require the construction of additional sewer lines. To date, proposed improvements have not been identified. The area presently being served in the Haines Branch basin is limited. An existing 12" sanitary sewer which parallels Van Dorn Street serves the present area. The scope of improvements necessary to serve short term growth in Haines Branch is believed to be minimal.

- Extension No. 11 North 84th St. Subarea - To serve the approximately 1,400 acres of the North 84th Street Subarea Plan, adopted by the City Council on November 25, 1996. (Amendment 9416)

- Extension No. 12 Salt Creek Relief - To provide relief for the existing Salt Creek trunk line, to allow for sewer planning to move forward and to accommodate future south and southwest development should it occur. (Amendment 9416)

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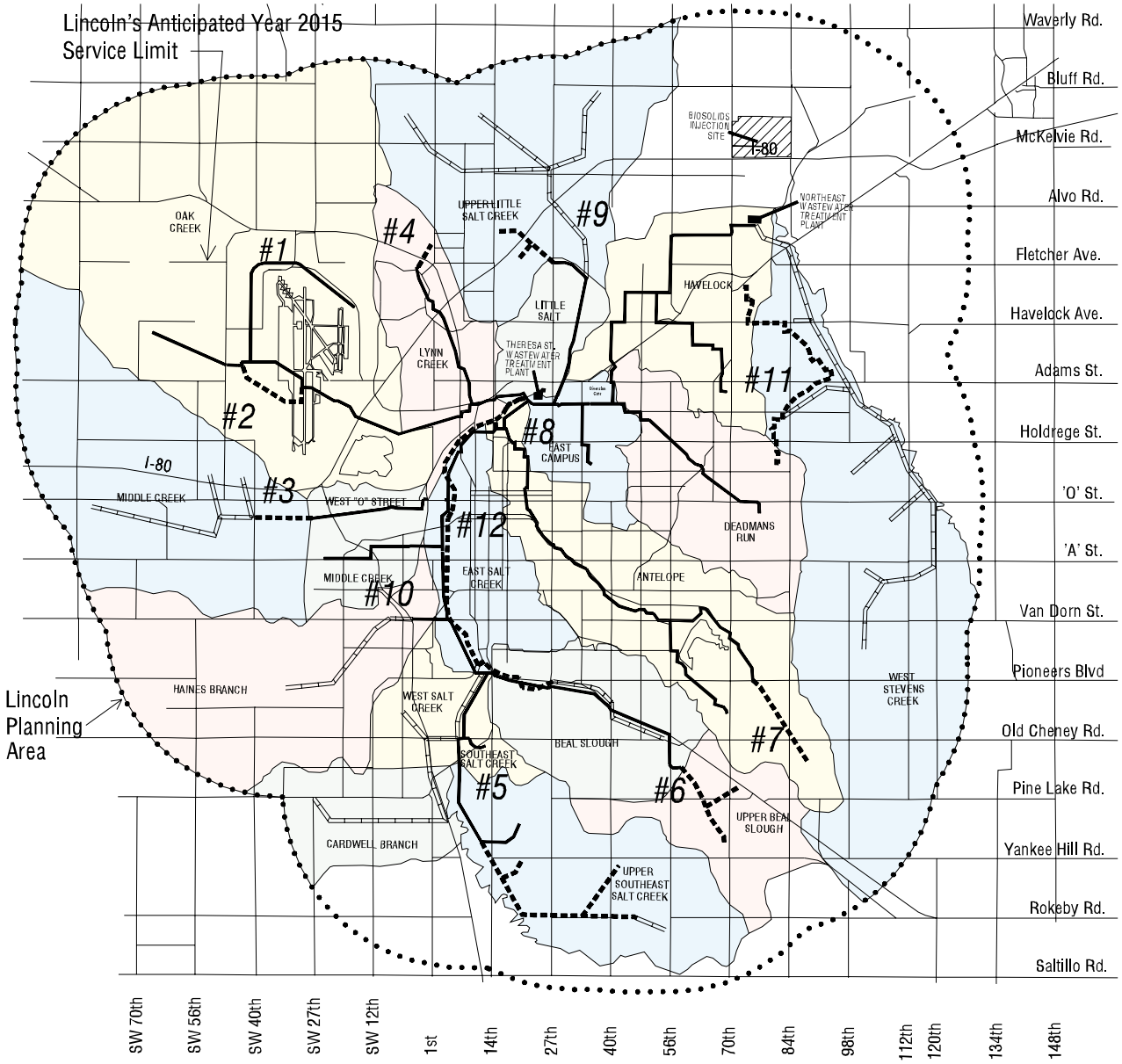

Figure 46

City of Lincoln Long Range Wastewater Facility Alternatives

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Lincoln City/Lancaster County
Comprehensive Plan

Trunk Sewers

Future Sewer Improvements Approved By Comprehensive Plan

Potential Sewer Improvements Beyond The Plan

Continued development in south Lincoln requires the construction of additional treatment facilities along with added Salt Valley trunk sewer capacity to service new areas. Additional treatment capacity at the existing Theresa Street Plant could meet growth needs. Figure 46, projects 8 and 12, reflect the improvements necessary to meet continued growth and to provide for the potential to accommodate long range growth options to the south and southwest.. Project 8 is underway. Any further relief sewer improvements along the Salt Valley trunk sewer would be built as parallel lines to the existing facility. The timing of any such improvements will be dependant upon the rate of development in the areas served by this line. (Amendment 9416)

Within the planning period, improvements to the Theresa Street and Northeast Treatment Facilities will be needed. Some of these improvements are necessary to meet stricter State NDEQ and Federal EPA effluent discharge limits. This will be accomplished through the construction of advanced nitrification and disinfection facilities that reduce ammonia and residual chlorine concentrations and effluent toxicity. Additional sewage treatment capacity may also be needed later in the planning period at both existing plants.

The Public Works and Utilities Department completed preparation of the "Lincoln Wastewater Facility Plan" in January, 1995. The plan delineates an improvement program of capital facilities designed to serve the growth needs shown in the land use plan, as well as potential service extensions beyond Lincoln's anticipated future service limit. The Facility Plan is hereby incorporated by reference as an approved component of the Plan. The Public Works and Utilities Department should continue to monitor and evaluate the validity of the pertinent design standards and to identify any areas which have opportunities or constraints. (Amendment 9405)

Finally, the current efforts to recycle and reuse sludge and wastewater should be continued and where feasible expanded.

Strategies:

- Maintain the policy of not providing sanitary sewer service beyond the city limits of Lincoln.
- Continue the policy of private financing the cost of local sanitary sewer development. Consider implementation of a benefit formula, by which the cost of mains that serve an entire area are shared by beneficiaries of the improvement. Continue to provide public funding for projects that provide community-wide benefits, programming these expenditures through the capital improvement process.
- Implement the program of main extensions during the planning period, as proposed in this section. Main sizes illustrated in Figure 46 are approximations and vary somewhat after detailed engineering. Each main should be sized to provide proper service to its distribution area.
- Analyze the potential options available for increasing Lincoln's wastewater treatment capacity to accommodate future growth. Options include expansion of capacity at the Theresa Street plant or development of a new southwest facility.
- Complete a detailed system analysis and long-range wastewater plan.
- Maintain and expand programs to recycle and reuse wastewater and sludge where appropriate.

C. Rural Water and Wastewater System

Goals

- *Protect the quantity and quality of ground and surface water.*
- *Ensure the preservation and proper utilization of environmental resources (e.g., prime agricultural land, soils, water, clean air, absence of noise, and native prairie and woods).*

Rural Lancaster County residents are served by private water and sewer systems, rural water districts (Figure 47) or by Sanitary and Improvement Districts (S.I.D.) (Figure 48).

Two rural water districts supply potable water to Lancaster County residents -- Lancaster County Rural Water District No. 1 and Cass County Rural Water District No. 2. These rural associations include property owners adjacent to the city limits. Either a limited well source or poor water quality (typically iron) is the reason for reliance on rural water supplies. Because of the costs of distribution, provision of fire flows is cost prohibitive. Financing of districts includes user fees, private lending institutions and Farmers Home Administration. Governing boards and hired staff assist with the operations and administration of these utilities.

Limited well source and poor water quality contribute to reliance on rural water districts. In addition, consumer preference and mortgage lending requirements have led to increased reliance on rural water districts. The rural water district's ability to approve applications for new water users is limited to the district's ability to maintain an adequate supply of potable water for its existing customers as well as the ability to secure necessary financing, additional sources of water, and continued maintenance of sound distribution and storage systems. Planning and sub-development policy should strive for concurrent development of water district infrastructure with development of the rural community in Lancaster County.

Sanitary improvement districts are political subdivisions that are sometimes created to meet a development's need for water, sewer, streets and services. S.I.D.'s are managed by elected boards and have taxing authority. Initially, Lancaster County S.I.D. #7, was constituted as a means of serving the Highlands Development needs. The District was unable to meet all of its financial obligations, and was ultimately annexed into the City of Lincoln.

Recent improvements in water quality monitoring technology and the passage of Federal Clean Water Legislation will increase our knowledge about and concern for water quality in the future. This concern will be especially acute for those who are served by private or small water systems which may not have capacity or resources to undertake sophisticated treatment systems.

Recent contamination of wells in various locations in Lancaster County are an indicator of possible future problems. Known areas of groundwater contamination should be mapped and incorporated into this plan within the next two years. In addition, new developments and individual residences outside of Lincoln but within the zoning jurisdiction of the City of Lincoln or Lancaster County, which are to be served by private wells or by rural water districts, should be required to affirmatively and positively demonstrate that an adequate and safe supply of water is currently available before final plat subdivision approvals are granted.

Wells and wellhead protection areas have been generally identified for the following land use jurisdictions:

Davey: Wells are located outside of the village, but within the village's land use jurisdiction. Land use jurisdiction of the wellhead protection area is shared by Davey and Lancaster County.

Denton: Wells are located within the village and the wellhead protection area is entirely within the village's land use jurisdiction.

Firth: Wells are located within the village and the wellhead protection area is entirely within the village's land use jurisdiction.

Hallam: Wells are located within the village and the wellhead protection area is entirely within the village's land use jurisdiction.

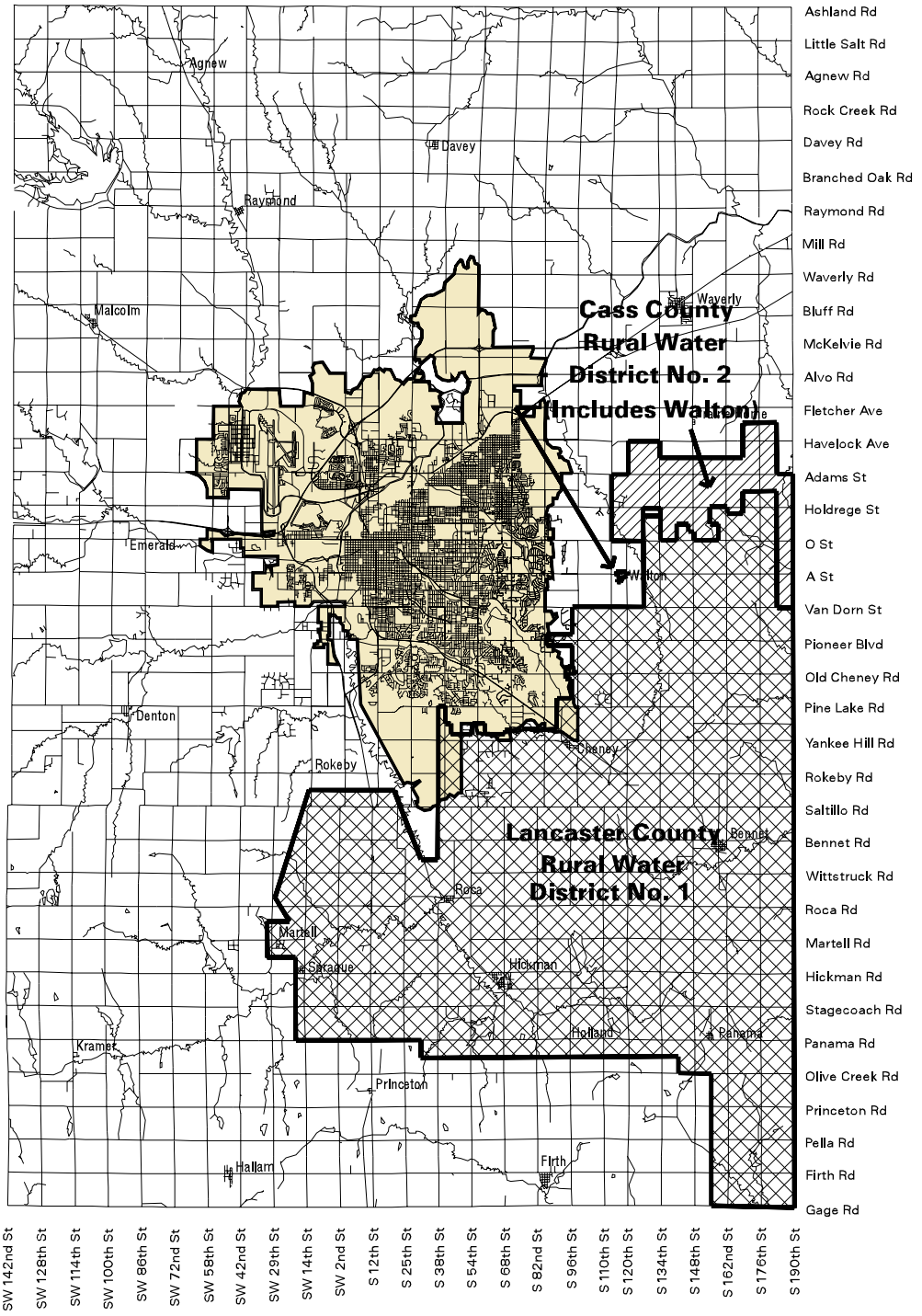

Figure 47
Rural Water Districts

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Lincoln City/Lancaster County
Comprehensive Plan

Rural Water District No. 1

Rural Water District No. 2

Lincoln Year 2015 Service Limit

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November 14, 1994

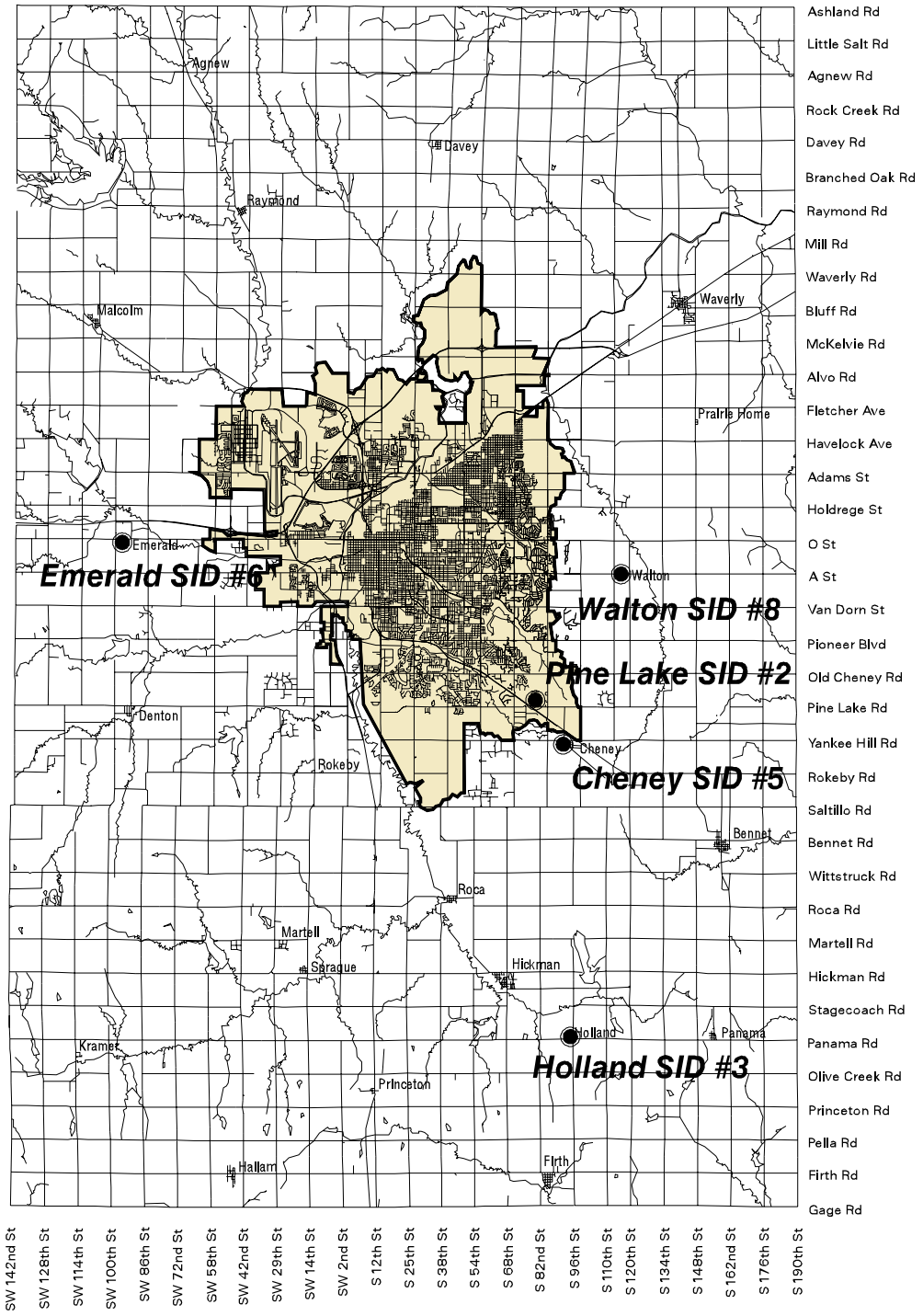

Figure 48
County Sanitary & Imprv. Dists.

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Lincoln City/Lancaster County
Comprehensive Plan

County Sanitary & Improvement Dist.

Lincoln Year 2015 Service Limit

Hickman:	Wells and wellhead protection areas are located outside of the City of Hickman and its land use jurisdiction. Lancaster County has land use jurisdiction over this area.
Holland:	Wells are located just south of the village, but Holland is unincorporated and has no land use jurisdiction. Lancaster County has land use jurisdiction over this area.
Malcolm:	Wells are located within the village. Land use jurisdiction of the wellhead protection area is shared by Malcolm and Lancaster County.
Panama:	Well is located north of the village limits, but within the village's land use jurisdiction. Land use jurisdiction of the wellhead protection area is shared by Panama and Lancaster County.
Raymond:	Wells are located on the edge of the village within the village's land use jurisdiction. Land use jurisdiction of the wellhead protection area shared by Raymond and Lancaster County.
Roca:	One well is located within the village limits while the other is located outside the village to the south, but within the village's land use jurisdiction. Land use jurisdiction for both wellhead protection areas is shared by Roca and Lancaster County.
Lancaster County RWD #1:	All wells are located in extreme southeastern Lancaster County within the County's land use jurisdiction. Land use jurisdiction for the wellhead protection areas of the three southeastern most wells is shared by Lancaster County, Gage County, and Otoe County. Lancaster County has land use jurisdiction for the wellhead protection areas of the other two wells.
Cass County RWD #2:	Wells are located in Ashland, outside the County.
Sprague:	Wells are located within the village and the wellhead protection area is entirely within the village's land use jurisdiction.
Waverly:	Three of Waverly's six wells are located within the city, while the other three are located outside the city to the southwest, only one of which is within the city's land use jurisdiction. The wellhead protection areas for four of the wells are entirely within Waverly's land use jurisdiction. Land use jurisdiction for the wellhead protection area of one of the other wells is shared by Waverly and Lancaster County and for the final well it is shared by Lincoln and Lancaster County.

Within the next two years, these areas should be mapped with the City-County G.I.S. and then considered for incorporation into the long range planning process of the county, the City of Lincoln and the other jurisdictions.

In April, 1995, the Lower Platte South Natural Resources District adopted an updated "Ground Water Management Plan." This plan outlines a program for the management of the area's ground water to protect the future quality and quantity of this valued resource. The Management Plan is hereby attached as an appendix for reference as an approved component of the Plan. This study may lead to the designation by the NRD of a Groundwater Management Area. This designation would provide the District with authority to exercise certain regulations over both nonpoint source water quality and quantity in both urban and rural areas. (Amendment 9405)

Lincoln's policy of extending water and sewer utilities only to areas that are annexed has been a tool for managing city expansion and government. Extending water and sewer utilities beyond the city limits has been a rare occurrence. This policy has assured a growing tax base and supported goals of restraining urban sprawl. Construction standards applied to locating and sizing facilities are made to facilitate maintenance and serve future development.

Private systems for water and wastewater utilities within the city limits have primarily served large commercial developments, multifamily apartment complexes, industry and government. These public-private operations have served well in some instances. These facilities most frequently make use of Lincoln's water supply source and wastewater treatment facilities. Future requirements for maintenance constitutes a concern and comparatively higher costs if these systems do revert to public ownership.

Private septic systems and community treatment facilities do not significantly alter surface water quality, so long as they operate properly. Access to both Lincoln Wastewater and Water facilities has been sought in the past where unsatisfactory performance has resulted or equipment replacement has become necessary. Designs for developments outside of the City and private service systems that might be permitted within the City properly should include consideration of how a future public utility would serve, access and maintain structures and appurtenances. As an example, buildings and similar structures should not be permitted over future utility corridors. Extension of Lincoln water and sewer service to areas serviced by rural water and wastewater systems will require the land served by the city utilities to be annexed into the City before utility connections are made. Such annexations may include provisions for phasing the development or installation of other municipal services. It is the policy of the community that water and sewer utilities shall not be extended to service land outside of the city unless that land becomes part of the city or is the subject of a specific zoning and annexation agreement.

Strategies:

- Map current systems in the City-County GIS for incorporation into the community’s continuing planning program.
- Consider designation of a Ground Water Management Area by the Lower Platte South NRD to protect groundwater supplies.
- Maintain future utility corridors where necessary to prevent rural developments from obstructing the orderly extension of utility services.
- Extend city water and sewer services outside the city only subject to a zoning and annexation agreement.
- The written policies of rural water districts as well as the ability of the districts to serve existing and future customers should be considered during the planning and subdivision of land located within the boundaries of rural water districts.

D. Stormwater Management and Flood Control

Goal

- *Minimize off-site and on-site flooding and soil erosion resulting from growth and development.*

Salt Creek and its tributaries historically have been a major flooding problem for the city. The existence of Wilderness Park, programs of farm dams and terraces and the construction of a series of flood control dams and reservoirs as part of the Salt Valley watershed project during the mid 1960's greatly reduced the flood hazard in these drainage areas.

The stormwater system in the city collects surface flows into Salt Creek from its tributaries including Antelope Creek, Dead Man's Run and Beals Slough. Responsibility for the development and management of the stormwater system is shared between the City of Lincoln and the Lower Platte

South Natural Resources District with the NRD generally assuming responsibility for the major channels and the city having responsibility for local collection. Figure 49 indicates the locations of storm sewer facilities.

Cooperation among public agencies has been and continues to be of importance in ensuring effective flood control. Several studies currently underway include: the study of Salt Creek through Lincoln by the Corps of Engineers; the study of Antelope Creek in Lincoln by the Corps of Engineers and the partnering efforts between the City, the University of Nebraska, and the NRD; the Corps of Engineers study of flood reduction on Dead Man's Run in Lincoln. (Amendment 9423)

The NRD completed and adopted the Stevens Creek Watershed study in 1997. The Stevens Creek Watershed Study and Flood Management Plan is hereby incorporated by reference as an approved component of the Plan. (Amendment 9423)

The stormwater system, how it is designed, operated and managed, is directly related to flooding and flood control. A stormwater system which is designed to rapidly discharge stormwater downstream increases flooding potential at the base of the drainage area. Floodplains grow larger if stormwater is not detained or retained in urbanizing areas.

The preservation and improvement of natural landscapes maintains or increases the useful attenuation characteristics of the drainage regime. Natural drainage ways also provide an excellent opportunity for the development of trails, and floodplains may be beneficially used for open space, parks and recreation or parking.

The City and County participate in the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). Maps of many of the floodplains and floodways in the community have been developed and adopted. Both the City and County have adopted land use regulations which restrict development in these areas.

As "quality" comes to receive emphasis equal to the "quantity" component, the stormwater management and flood control system will face a number of new challenges in the planning period. The new Federal Clean Water Act will require extensive involvement by local government in the identification of sources of pollution in the stormwater system and in the development and implementation of measures to reduce that pollution. Federal regulations place the responsibility and financing for the management of storm water directly upon local governments. Specifically the regulations apply only to the City. Proper planning and control will require direct interaction between both City and County administrations.

The first step in compliance with the regulation is the development and implementation of a Master Storm Water Management Plan. This plan will detail all aspects of identifying, controlling, and mitigating problems in the storm water system. Education, funding, planning, development of legal authority, and enforcement of the resultant regulations must be identified. The plan deals with both capacity and quality issues.

The Beal Slough Basin Stormwater Master Plan, as revised in May of 2000, was completed in July of 1999 and is hereby incorporated by reference as an approved component of the Comprehensive Plan. The Beal Slough Plan will serve as a tool for stormwater management within the basin and a model for other basins to be studied in the future. It is expected to be the first of a comprehensive effort to complete a Stormwater Management Master Plan by studying each basin within Lincoln and its anticipated growth areas. Future master planning efforts for largely undeveloped basins will rely more heavily on pro-active better management practice (BMP) measures and the conservation of existing natural attenuation features within the drainage regime to most effectively manage stormwater. Designs of human made features will seek to utilize bioengineering and other naturalized techniques, incorporating trail systems and other linear park features where possible. (Amendment 9438)

Historically storm water funding has been through the City's general fund and the NRD. Because the availability of those funds is becoming extremely limited, new and innovative funding methods will have to be developed. The development of these funding methods must continue to recognize the benefits to the entire community of storm water management. Developer contributions, while an important component, should not be viewed as the only available funding source. It is expected that the implementation of the regulations will place a financial burden upon the City in the magnitude of five to six times that which has been previously provided. Some methods to be considered might include ad valorem taxes, user fees, bonds, and utility bills. The locations of recommended construction projects to solve known localized conflicts is shown in Figure 50.

The remapping of floodplains by FEMA, some of which is the result of new urban growth, will restrict use or require measures to protect flood prone designated areas. Public and private locations are affected. Some floodways have not been mapped and this may result in dramatic changes in the floodplain if permits to fill are granted in an area which would convey the floodwater. Finally, the

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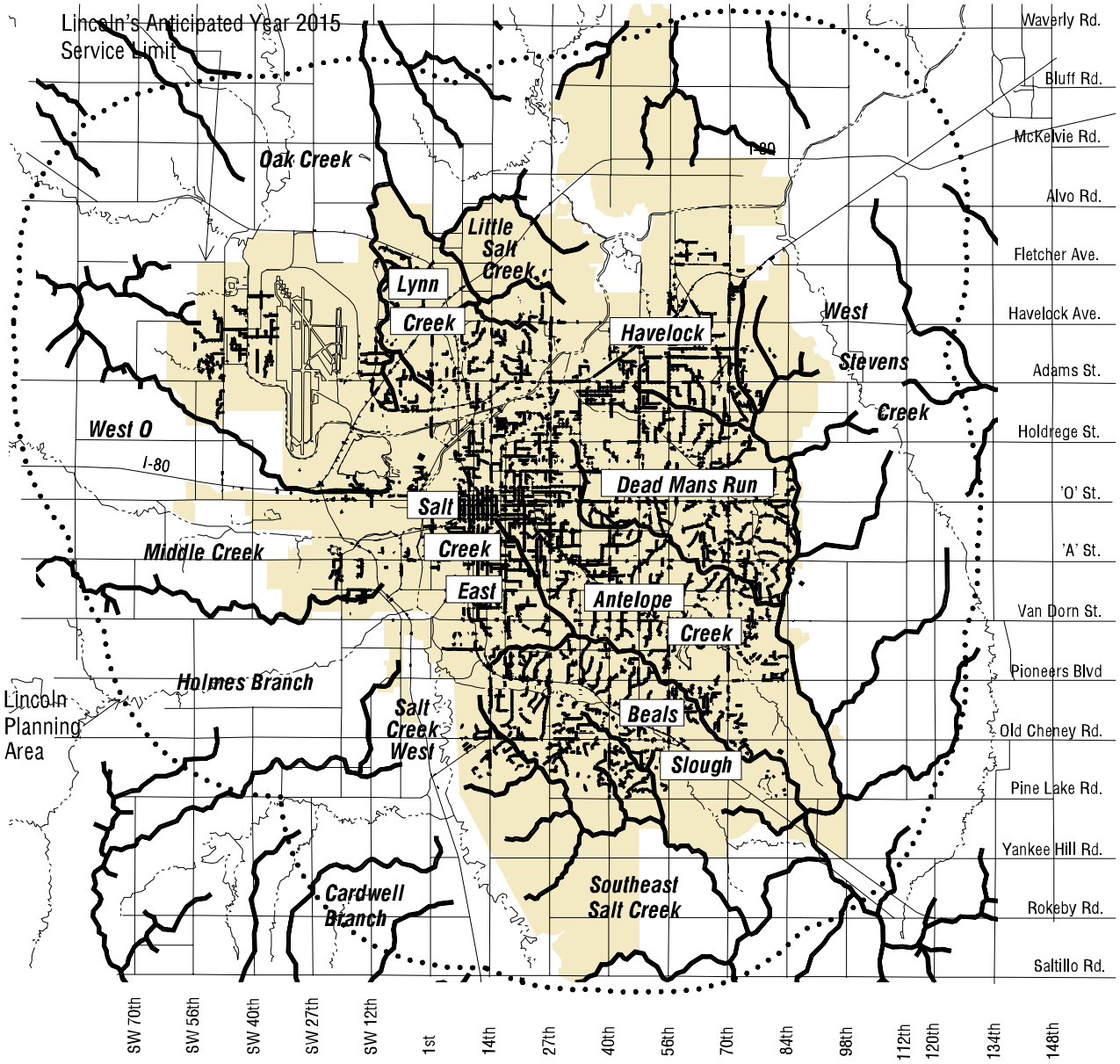

Figure 49

Existing City Storm Sewer System

Existing Storm Sewer Lines

Drainage Basins (Ridgelines)

Streams and Lakes

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Lincoln City/Lancaster County
Comprehensive Plan

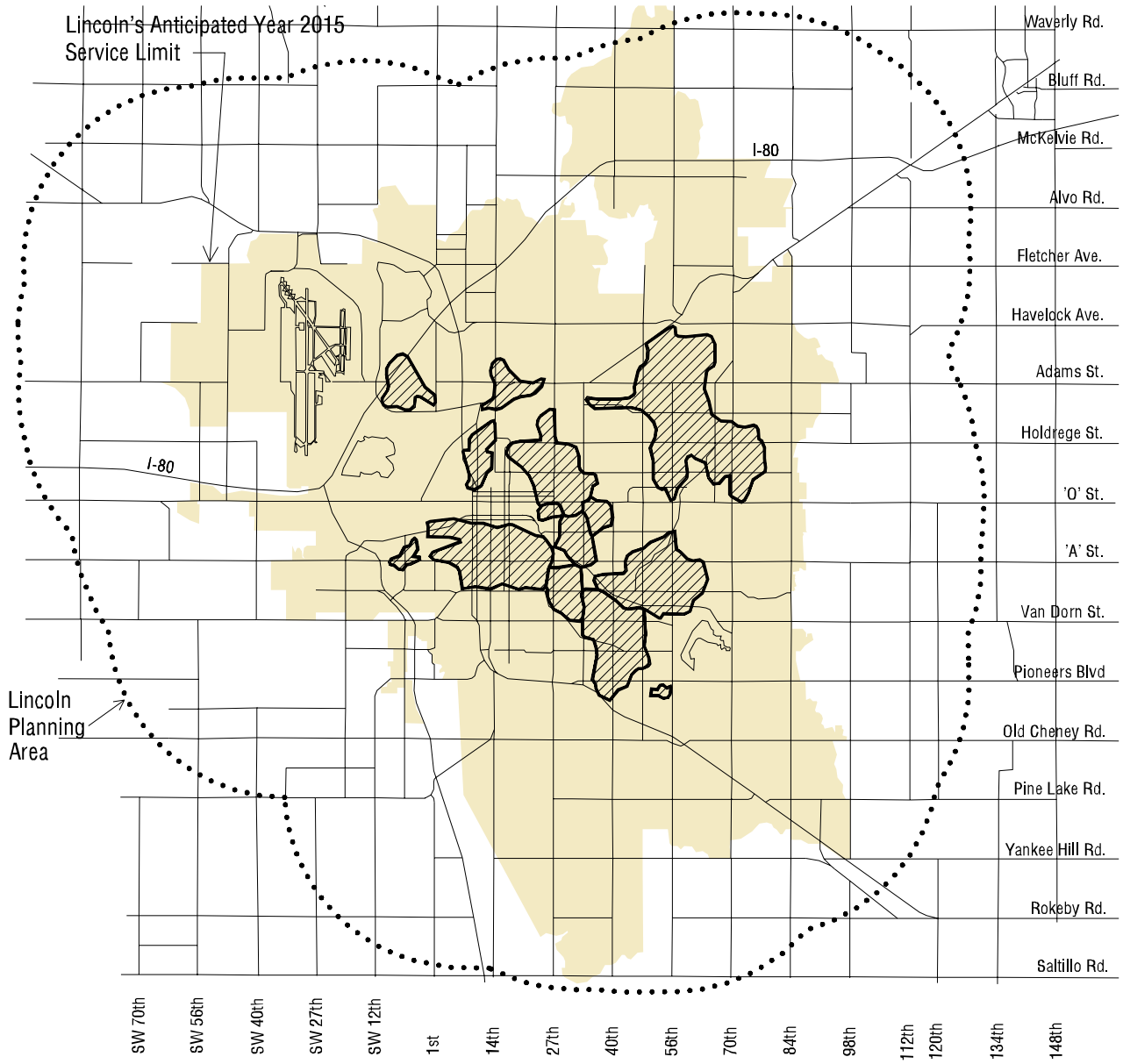

Figure 50

Drainage Areas Identified For Future City Storm Sewer System Improvements

Drainage Area

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Lincoln City/Lancaster County
Comprehensive Plan

current regulations which allow the placing of fill in a floodplain may not be adequate and the issue of compensatory stormwater storage should be considered.

One way in which the community might approach the management of storm water is to view stormwater as a potential asset.

Positive uses of stormwater include water harvesting, retention or detention for landscaping, aesthetics, natural habitat, or recreational use. One such area that should be investigated as a potential park, wetland, open space or continued agricultural use--which will occasionally be flooded--is in the vicinity of 84th Street and Highway 6. Positive use of stormwater corridors would include trails and natural habitat corridors.

Onsite management of stormwater for positive use, and the multiple use of stormwater corridors should be incorporated with land use regulations and project design. Siltation of storm cells and drainage ways will cause costly maintenance. Adequate space for maintenance and dredging is essential. Higher ground water elevations in the vicinity of these cells may affect below grade structures and utilities.

The management of stormwater and the opportunity for using the stormwater corridors for trails is an issue that should be further investigated during the planning period by the City, County, NRD, FEMA, the Trails Advisory Committee, and representatives of various city and county residents, neighborhood groups, and businesses which will be adjacent to these locations.

Strategies:

- Continue to regulate development in floodplains and floodways. Be prepared to respond to findings that suggest that current restrictions have off-site effects and are inadequate to protect property.
- Maintain a regional approach to Federal stormwater mandates, involving the City, County, NRD, and other agencies.
- Examine alternatives for financing stormwater improvement projects.
- Develop project approaches which view stormwater as an asset, utilizing natural drainage patterns, retention and detention facilities, wetlands, and drainage corridors as natural ways to manage run-off.
- Complete a Stormwater Management Master Plan for the City of Lincoln and its protected growth areas that emphasizes pro-active stormwater planning for future developing basins. (Amendment 9438)
- Implement the recommendations of the Wilderness Park Subarea Plan as they relate to the flood plain and stormwater quality and quantity issues. (Amendment 9442)
- The City and County should utilize the Beal Slough Basin Stormwater Master Plan recommendations, project components and computer modeling as analysis tools to be referenced and compared with proposed private and public development in the Beal Slough drainage basin; projects identified in the Plan should be considered in preparing future capital improvements projects. Broad public participation should be sought in the location and design of specific projects. The relative benefits of the projects to be evaluated should include impacts on the flood hazards, water quality, channel integrity, natural character, bridges, culverts, and existing public and private structures. Property owners at the proposed sites shall be involved in the discussions during the analysis of alternatives and approaches and during the preliminary engineering of the projects. (Amendment 9438)
- Implement the Antelope Valley flood control project to construct a new, open channel that will contain the waters of a designated “100-year” rain-fall event. The project also entails the replacement of the South Street bridge over Antelope Creek, removal of the 38th Street bridge and potential enhancements to the channel south of “J” Street. The project will designate a flood plain that is within the banks of a new channel, will remove a large portion of the central city from the designate flood plain, and will allow for revitalization of the area. The new channel will be developed in a park-like atmosphere between “J” Street and Salt Creek. A trail will be constructed along the length of the new channel. (Amendment 9460)

E. Solid Waste

Goals

- *Preserve the quality of natural resources through policies which promote recycling and conservation.*
- *Create a county-wide integrated, efficient, environmentally safe and conservation-oriented recycling and waste management system. Supplementary statements: a) Reduce the amount of waste going into landfills; b) Develop a waste management plan naming responsibilities of citizens, recycling industries, haulers and governments; c) Promote and support markets for waste materials and recycled products; d) Stop illegal dumping.*
- *Develop a county-wide recycling and waste management system that includes all city, town and rural areas.*
- *Provide for the prohibition and removal of abandoned vehicles and other types of junk.*

The City operates a number of facilities to provide environmentally acceptable solid waste management for Lincoln and Lancaster County. Included in those facilities are the Bluff Road Landfill and yard waste composting facilities, North 48th Street Construction and Demolition Waste Landfill, Transfer Station and Inactive Landfill (Figure 51) and small vehicle waste transfer station and numerous recycling dropoff locations.

No out of county waste is accepted for landfill disposal. This policy reserves landfill capacity for city and county residents and allows administration of programs under existing authorities.

The city-county effort to find an alternative to the current landfill site should begin at least 5 - 10 years before such a decision is needed; the planning related to this effort should include representatives from all the rural areas surrounding Lincoln (i.e., north, south, east, west). Area adjacent to the landfill is a possible future site. At the beginning of the planning period, the landfill's projected life is 25 years and the construction and demolition site life is 5 years.

The City-County Solid Waste Management Plan is hereby incorporated by reference into this Comprehensive Plan, including recycling and waste stream reduction goals and strategies. Toxicity reduction and special waste issues are included in construction programs.

Both the City and County operate under the requirements of the Nebraska Integrated Solid Waste Management Act. This Act establishes solid waste disposal and handling requirements for Nebraska localities. Specific waste reduction and recycling goals are set forth in the Act. Based on 1992 levels, the Act looks for local jurisdictions to strive for a 25 percent waste reduction and recycling rate by 1996; a 40 percent rate by 1999; and a 50 percent rate by 2002. Interlocal agreements between the City, County and most incorporated areas have been executed.

Recycling should be encouraged in the City and County land use policies by encouraging the development of sites for collection and other sites for material handling and processing. Recycling drop centers should be considered as a component of all mixed use areas and all new community and neighborhood retail centers. An ample supply of industrial sites for material handling and processing should be provided. All new commercial and residential developments should consider how they will handle waste and recycables on the property, and how recycled products might be used in the construction of new facilities. Also, drought tolerant plantings and slow growing grasses should be encouraged throughout the City and County to reduce yard waste and promote water conservation.

Strategies:

- Establish an anticipatory approach to the community's need for a replacement landfill, convening involved parties well in advance of a crisis date.
- Encourage community-wide recycling programs, including the location of sites for material collection and handling/processing at strategic locations.
- Include recycling collection facilities at major public places, such as mixed use areas.
- Encourage drought-resistant landscape materials to conserve water and slow-growing grasses to reduce the yard waste stream.
- Continue to study and implement, where feasible, alternatives to landfills for disposal of solid waste.

F. Electric Service

The Lincoln Electric System (LES) is owned by the City of Lincoln and is operated under the direction of an administrative board which is appointed by the Mayor and City Council. LES is revenue producing and self-supporting (i.e., no tax funds are used by the system). LES provides electric service to the City of Lincoln and most of the surrounding area within Lincoln's three-mile planning zone, including City of Waverly and the unincorporated villages of Cheney, Walton, Prairie Home, and Emerald (Figure 52). Other parts of rural Lancaster County are served by the Norris Public Power District.

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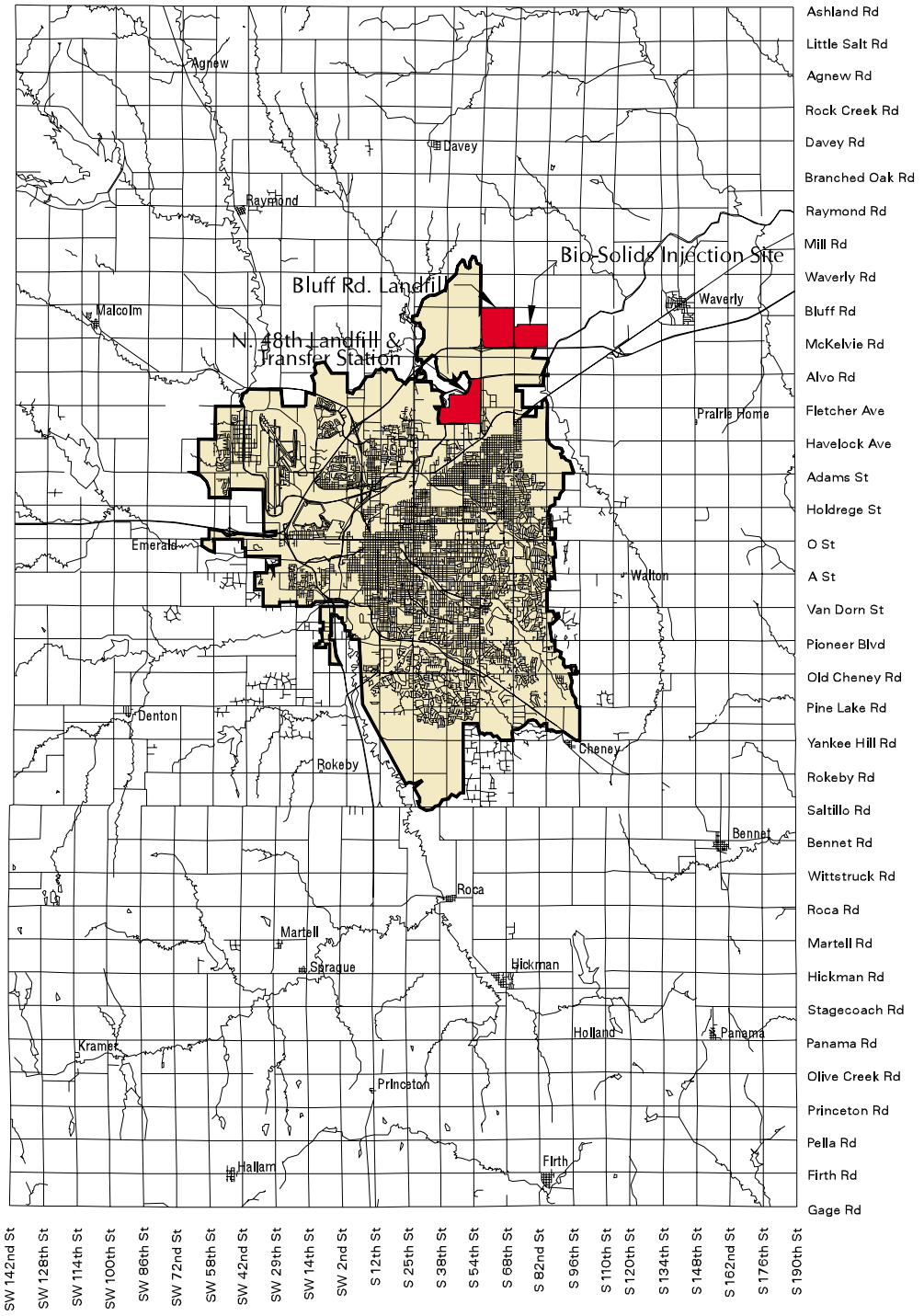

Figure 51

Lincoln Area Landfill Sites

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Lincoln Area Landfill Site

Lincoln Year 2015 Service Limit

Lincoln City/Lancaster County

Comprehensive Plan

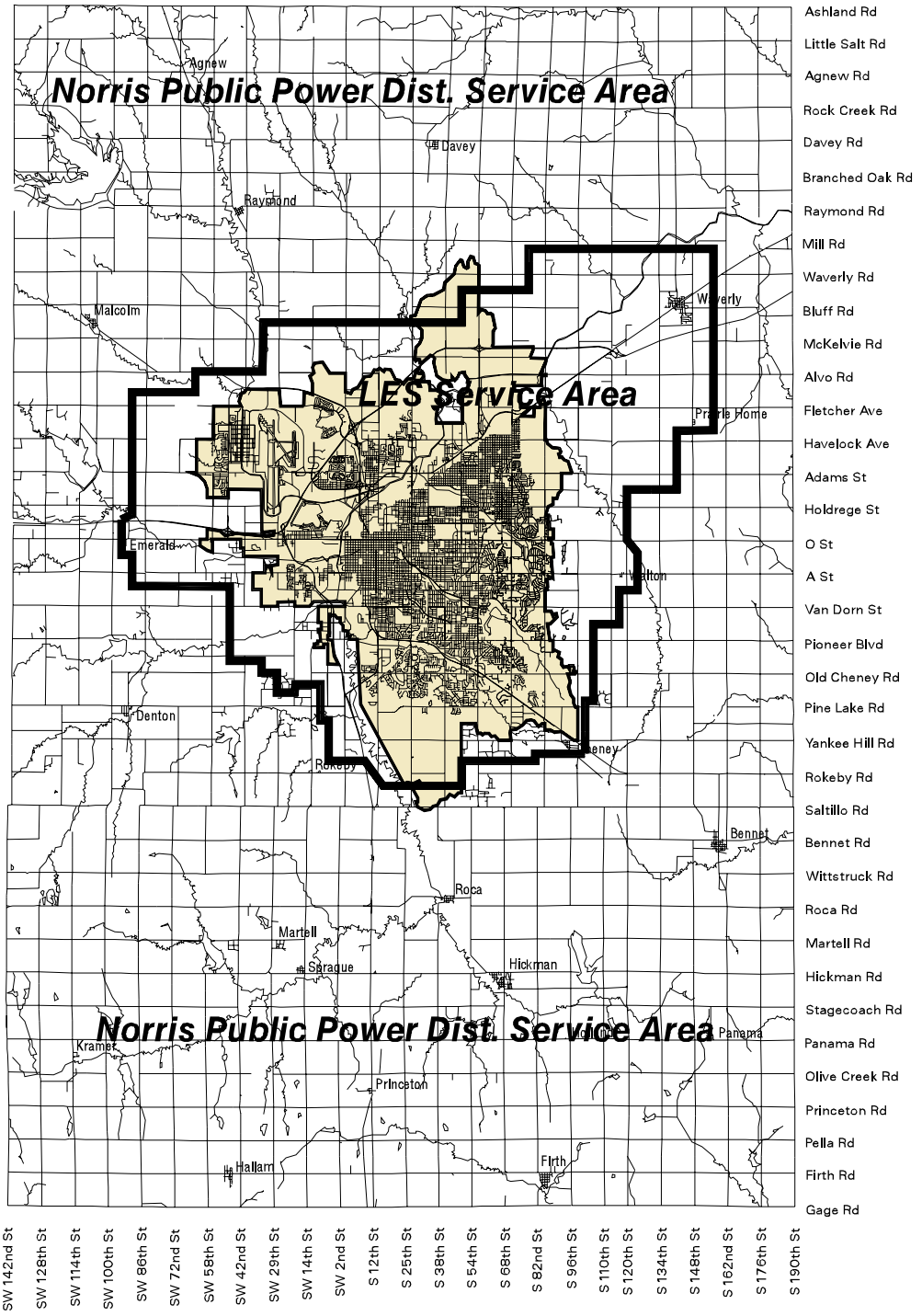

Figure 52
Electric Sys. Serving Lancaster Co.

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Electric Service Area Boundary

Lincoln Year 2015 Service Limit

Lincoln City/Lancaster County
Comprehensive Plan

Where feasible, existing and future transmission line corridors should be used for multiple purposes including transportation (street and trail) and other utility uses (Figure 53).

As the City of Lincoln grows, the City boundary may approach and/or overlap the service areas of other public power companies. This is one of the jurisdictional issues which will need attention. The City of Lincoln should be served by one electric utility.

Strategy:

- Assure that as Lincoln grows, electric utility service receives unified management by LES.
- Assure maintenance of quality electrical service to county residents outside the jurisdiction of LES.

G. Fleet Management

Equipment management is an integral section of the Public Works Maintenance Division. Service and repair facilities are located at the Street Maintenance headquarters at 901 North 6th. The facilities consist of two garages--a 19,942 square foot facility for major repairs and a 6,561 square foot minor repair and service center. The division also maintains nine (9) automated fuel facilities with a total gallonage of 248,000 gallons. These nine sites disperse 400,000 gallons of fuel annually.

The primary mission of the Equipment Management Section is the perpetuation of the City's Vehicle Equipment Fleet in the most safe, reliable and efficient manner possible.

The current fleet consists of 958 units comprised of turf equipment, medium and heavy-duty trucks and heavy construction and street maintenance equipment. Estimated replacement cost of the fleet is $12,000,000. Annual fleet utilization is 2,000,000 miles per year.

Equipment management is a revolving fund supported operation. The cost of operation is recovered through rental rates collected on the equipment used by City departments.

The size and configuration of the fleet is determined by the geographic size of the community, technological advancements and environmental requirements.

Fleet perpetuation should include long range planning directed towards the use of multi-functional units, reduction of dependence on foreign fuels, use of the most ecological units available and cross utilization of the fleet by all local government entities to provide the highest level of utilization at the lowest cost to the citizens of the community.

H. Communications

Lincoln and Lancaster County are interconnected with the Information Super Highway. Lincoln Telephone serves Lincoln, Lancaster County and 22 counties in the southeast corner of the state. One thousand two hundred and fifty miles of fiber optic is in place throughout Lincoln and the county. This system inter-exchanges with international carriers, AT&T and Sprint, who have fiber optics throughout the county. State, national, and international satellite telecommunication conferences have been pioneered by the University of Nebraska.

Strategies:

- Continue to assure that Lincoln and Lancaster County are fully served by development of the "Information Super Highway".

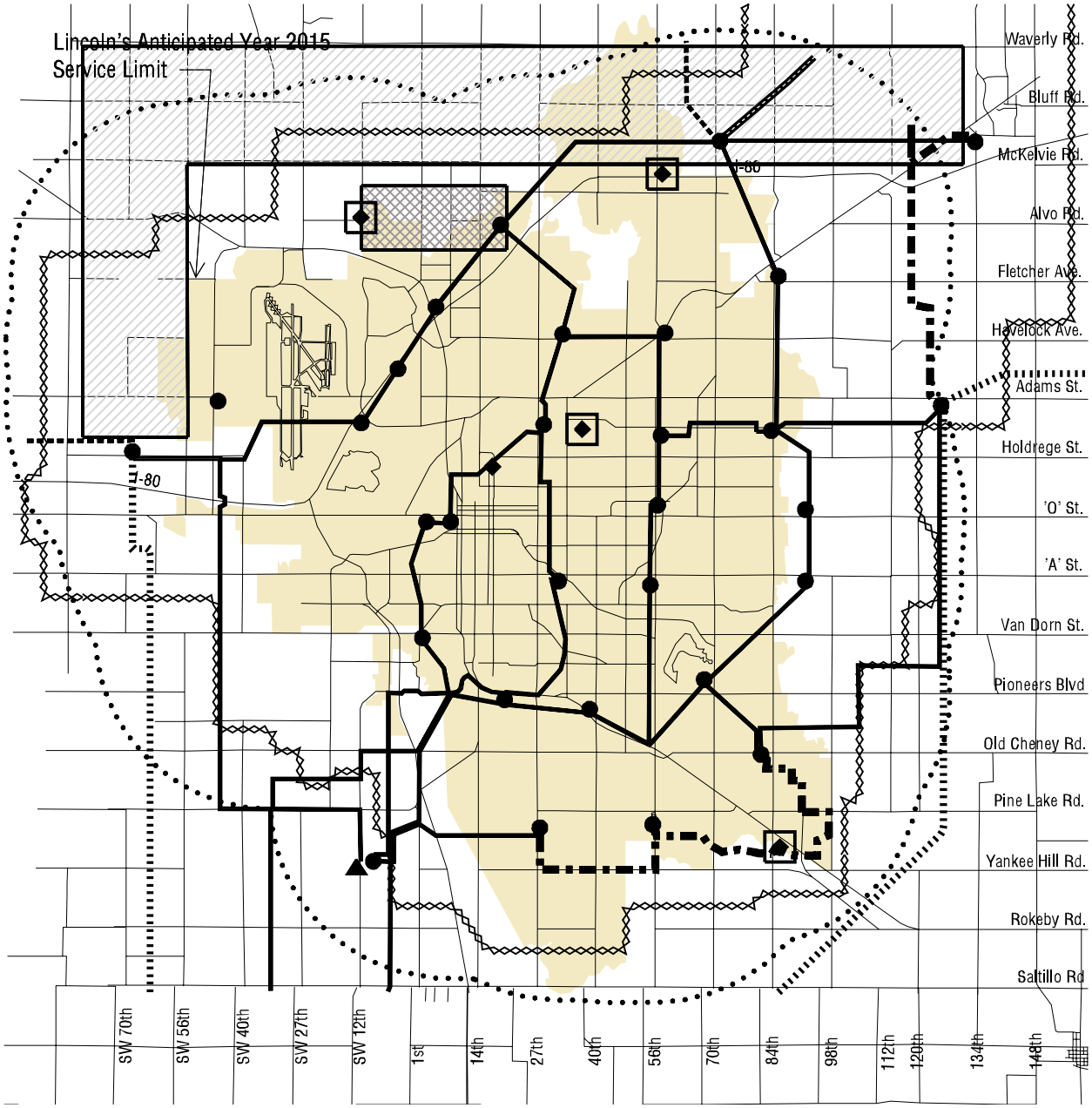

Figure 53

Lincoln Electric System (LES) Service Area, Transmission Lines, and Other Facilities

(Note: Location of future facilities is approximate. Actual location will be determined through future studies.)

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Lincoln City/Lancaster County
Comprehensive Plan

- *LES Service Area*
- *LES 115kV Line (Existing)*
- *LES 115 kV Line (Proposed)*
- *Nebraska PPD 115 kV Line*
- *LES 161 kV Line*
- *LES 345 kV Line*
- *Existing Substation*
- *Existing Generator Facility*
- *Proposed Substation*
- *New Proposed Substation*
- *115 kV Line Route Study Area*
- *345 kV Line Route Study Area*